



IMAGE SERVICES

System Administrator's Companion for UNIX

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About This Manual

The *Image Services System Administrator's Companion for UNIX* supplements the **[System Administrator's Handbook](#)**.

This companion manual for the Image Services system administrator provides information specific to Image Services for the following UNIX operating environments:

- AIX/6000
- HP-UX
- Solaris®

[Chapter 1, "Operating System," on page 15](#) describes startup, shut-down, logins, groups, and console operations.

[Chapter 2, "System Management Tools," on page 38](#) describes how to use the system management tools for AIX, HP-UX and Solaris.

[Chapter 3, "Directories and Files," on page 67](#) describes file organization, file naming, and navigation through the file systems.

[Chapter 4, "Problem Solving," on page 95](#) describes the various problem solving tools and strategies you can use when working with the FileNet software.

[Chapter 5, "Tape Support," on page 107](#) describes tape drive and tape media support, including tape operations, utilities, and commands.

Note Refer to the manuals shipped with your system for information on backing up the operating system.

Note Backup for the FileNET system is handled by the Enterprise Backup and Restore utility or a third party tool. For more information see the [***Enterprise Backup/Restore User's Guide***](#) or the [***Third-party Backup/Restore Guidelines***](#).

This handbook covers the full range of functions provided by the software. However, your system hardware and operating system (called a platform) may not support all the functions and applications described here. For example, if you are using a Combined server setup, none of the multiple-server or networking functions apply to your situation.

Desktop applications access Image Services. Throughout this manual, when we refer to your desktop application, we are talking about the PC client product you use to interface with Image Services.

If you have not purchased a particular FileNet software option, parts of this manual describing that option do not apply to your system.

Related Documentation

We assume that you are familiar with system commands and procedures for your operating environment. Refer to the documentation and online help included with your operating system for information.

FileNet ships the [***System Administrator's Handbook***](#) and this companion manual with Image Services software. The following documentation is available from FileNet:

- [***System Administrator's Handbook***](#)

- [*Index and WorkFlo Database Contents*](#)
- [*Enterprise Backup/Restore User's Guide*](#)
- [*Third-party Backup/Restore Guidelines*](#)

UNIX resources include publications and online help. This chapter includes information on your operating environment but is not sufficient as an introduction to UNIX for new users.

For UNIX commands mentioned in this manual, you can display a manual page (also referred to as man pages). For example, to display the manual page for the tar command, enter the following command at the console:

```
man tar
```

Conventions Used in this Manual

The following paragraphs describe the typographical conventions used in this document.

Multiple Server Configurations

MultSv

The flag to the left of this paragraph indicates information for users with more than one server. Users with single-server configurations should ignore sections labeled with this flag.

Typing Instructions

To indicate commands, values, or other information you enter at your keyboard, we use the following indentation and typeface:

help [CSM_exim]

Console Displays

This document shows information displayed at your console in the following manner:

```
Surface '3176' : 1 document processed
Local doc_id = '2235007' Original doc_id = '2235007'
Original ssn = '8502'
Primary copy. No tranlog copy exists.
* document successfully deleted from databases. *
* Purging pages from disk... *
* This document has been successfully purged. *
```

Cautions, Notes, and Tips

Three message types call your attention to important information:

CAUTION Signals possible damaging consequences of an action, such as loss of data or time.

Note Draws your attention to essential information you should be sure to read.

Tip Introduces an idea that might make your work easier.

Command Syntax

Command syntax definitions are indented:

```
ddexim -e > <filename>
```

Optional Parameters

Optional parameters and keywords are within square brackets:

```
ddexim [-e] > <filename>
```

Required Parameters

Parameters that require you to provide information are shown within angle brackets (< >). For example, for the following command:

```
ddexim -e > <filename>
```

you must substitute the name of a command for the parameter in angle brackets, such as:

```
ddexim -e > myfile
```

FileNet Education

FileNet provides various forms of education. Please visit Global Learning Services on FileNet's Web site at www.filenet.com.

Comments and Suggestions

FileNet invites all customers to communicate with the Documentation group on any question or comment related to FileNet manuals and online help. Send email to docs@filenet.com. We will make every effort to respond within one week. Your suggestions help us improve the products we deliver.

Operating System

About This Chapter

This chapter presents information on the UNIX operating system and performing Image Services system administration duties, including:

- Sources of information on your UNIX operating environment (AIX, HP-UX, or Solaris)
- Powering on, rebooting, and powering off your system
- Operating system logins
- Console operations
- File system navigation and file operations
- Opening and closing shell windows

We assume that you are familiar with basic computer terminology. See the ***System Administrator's Handbook*** for additional information about Image Services software.

Supported Platforms

Image Services software is compatible with the AIX, HP-UX and Solaris UNIX server operating environments.

AIX

AIX

For information on AIX, refer to the manuals included with your AIX system.

AIX online documentation includes the InfoExplorer program. InfoExplorer accesses thousands of pages of AIX information stored on CD-ROM. See your AIX documentation for information on mounting the CD-ROM file system.

HP-UX

HPUX

For information on HP-UX, refer to the manuals included with your HP-UX system and the HP-UX online documentation on CD-ROM.

Solaris®

SOL

For information on Solaris, refer to the manuals included with your Solaris system.

Powering On Your System

Refer to the appropriate power-on procedure for your configuration:

Combined Server System

Power on a Combined server system as follows:

- 1 Power on all peripherals.
- 2 Power on the Image Services Combined (Root/Index/Storage Library) server.

Wait for RDBMS initialization and Doc Server initialization to complete before proceeding to the next step.

- 3 If there are any application servers attached to the Combined server, power them on in any order.

Continue with the section, [“Startup Indicators” on page 18](#).

Multiple Server System

MultSv

Power on a system with multiple servers as follows:

- 1 Power on all peripherals.
- 2 Power on the Image Services root/index server.

Wait for RDBMS initialization to complete before proceeding to the next step.

- 3 Power on, in any order, the main storage library server (the Document Locator server), and all other storage library servers.
- 4 Power on the application servers one at a time in any order.

Continue with the section, [“Startup Indicators” on page 18](#).

Startup Indicators

While booting an Image Services server, the operating system checks for hardware configurations that can cause the system to operate improperly. Refer to the notes for your operating environment.

AIX Startup Indicators

AIX

The LCD values that indicate a successful boot vary by server. When you power on or reboot an AIX server, the LCD displays a sequence of numbers. When the server is up, the LCD becomes blank. Wait another five minutes while the FileNet software initializes. Check the monitor for the boot messages and login prompt to verify that the boot was successful before rebooting another server. If the LCD displays a number instead of going blank, consult your operating system administrator.

If the AIX senses a problem, a warning message displays on the system console and recommends a corrective action. AIX also adds an entry to the AIX error log.

HP-UX Startup Indicators

HP-UX

HP-UX checks for the status of hardware components and file systems. Upon finding a problem, HP-UX displays messages on the system console. Refer to your vendor-supplied problem solving manuals for recommended corrective actions for booting errors.

Image Services software automatically verifies the kernel parameter settings every time you start the FileNet software.

The **cfg_verify** program runs automatically during every Image Services start. The program logs an error for each incorrect parameter. You must check the system log to determine which kernel parameter is

set incorrectly. Use the **vl** tool to find the `cfg_verify` assertion errors. Enter **vl** from any directory.

The system log may contain an entry similar to this:

```
cfg_verify: assertion (software.HP.HPUX.SHMMAX (0x4000000) >= 0x10000000)
failed
03/01/20 17:46:11.200 212,4,7 <fnsw> cfg_verify (16319) ... [CRITICAL]

cfg_verify: 2 assertions failed due to an improperly configured system.
Previous error messages indicate whether the misconfigured entity is
hardware or software, which parameter is misconfigured, and what the
requirements are.
```

In this case, 0x4000000 (67108864 Bytes or 64MB) is not greater or equal to 0x10000000 (268435456 Bytes or 256MB), so the comparison failed. You must use SAM, the HP-UX operating system management tool, to modify the incorrect kernel parameter `SHMMAX = (0x4000000)` to a legal value (0x10000000) and reboot the server to make the change effective.

Note Even though SAM displays the kernel parameters in decimal, you can enter modified values in hexadecimal, (for example, 0x10000000) and SAM automatically translates the hex value to decimal for you.

Fix all invalid kernel parameters before rebooting and trying to start Image Services again.

Solaris Startup Indicators

SOL

Solaris displays messages similar to the following on the system console:

```
The system is coming up. Please wait.  
The system is ready.  
servername console login:
```

Rebooting Your System

Rebooting the system restarts the operating system software. Usually, you reboot the system as part of an installation, configuration, or troubleshooting procedure. You can perform a soft reboot or a hard reboot. The rebooting sequence depends on your system configuration. For complete details on rebooting, refer to the documentation shipped with your system.

Performing a Soft Reboot

You perform a soft reboot while your system is powered on and usually after upgrading the software or modifying your system. This recycles your system software.

Performing a Hard Reboot

To perform a hard reboot, you power your system off, then on again. Usually, you perform a hard reboot after a hardware maintenance operation. See [“Powering On Your System” on page 17](#) and [“Powering Off Your System” on page 21](#).

Powering Off Your System

Although the system usually remains running, you must occasionally shut down the system to correct problems or perform hardware maintenance. In addition, you may have to shut down quickly in an emergency. Shutting down the system improperly can cause damage to your system or file systems. The power-down order is the reverse of the power-up order.

To power down the system, perform the following steps:

- 1 Notify all users that the system is going down and ask them to log off.
- 2 Shut down the Image Services software by performing the following steps first at each Image Services non-root server and last at the root server.

AIX and HP-UX	<ol style="list-style-type: none">a Log on at an X-station or PC running X Windows, as a user who has simultaneous membership rights in all three of the following groups: <code>fnusr</code>, <code>fnadmin</code> and <code>dba</code>.b Start the Task Manager by entering the following command at a UNIX prompt: Xtaskman &c Click the Task Manager Stop button to shut down the Image Services software properly.
----------------------	---

Solaris	<p>a Log on as a user who has simultaneous membership rights in all three of the following groups: , fnusr, fnadmin and dba.</p> <p>b When the prompt “Start motif?” displays, enter y to start a graphical user interface environment.</p> <p>c Start the Task Manager by entering the following command at a UNIX prompt:</p> <p style="text-align: center;">Xtaskman &</p> <p>d Select “MWM Quit” from the operating system menu to quit the Motif Window Manager.</p> <p>e Click OK at the prompt “QUIT mwm?”</p>
----------------	--

Log off or exit from any open applications.

- 3** Log in as the root user.
- 4** Shut down the operating system at each server with one of the following commands:

Operating Environment	Command	Description
AIX	shutdown	No other users are logged on to AIX.
	smit shutdown	Other users are logged on to AIX.
	shutdown -F	Shut down as quickly as possible.

Operating Environment	Command	Description
HP-UX	shutdown -h	Shut down properly.
Solaris	shutdown -g<nnn>	Shut down the operating system cleanly, where -g is the grace period and <nnn> is the number of seconds of grace period given as a broadcast message warning users to log off their applications before the system is shut down.

- 5 Turn off power to the Image Services server after the appropriate message displays for your operating environment:

Operating Environment	Message
AIX	Halt completed
HP-UX	OK to power off
Solaris	Shutdown started Broadcast message The system will be shut down in 30 seconds The system is being shut down now!!! (The screen display becomes blank.)

- 6 Power off peripheral devices connected to your server (for example, local printers and scanners), if necessary.

Groups

This section describes the following Image Services administration groups: **fnadmin**, **fnop**, **dba**, **fnusr**.

The **fnadmin** Group

You must be a member of the **fnadmin** (FileNet Image Services administration) group to start and stop Image Services software, place Image Services software in either restore or backup mode, or run tools (without running the **fnlogon** tool) that require Image Services security. Members of the **fnadmin** group have full rights to the files and directories in the Image Services software. The **fnadmin** group is created during software installation or software updates.

The **fnop** Group

Members of the **fnop** (FileNet Image Services operator) group only have permission to start and stop the Image Services software. For example, users who access the Task Manager must be a member of **fnop** (or **fnadmin**). The **fnop** group is created during software installation or software update.

The **dba** Group

Members of the **dba** (Database Administration) group can start, stop, and configure the relational database management software (RDBMS). The **dba** group is created during software installation or software update.

The **fnusr** Group

Members of the **fnusr** (FileNet Image Services user) group have privileges for running the Image Services server applications, such as Application Executive, Cache Export/Import, COLD, Database Maintenance, and Storage Library Control.

Logging on to the Operating System

You access the operating system by logging on at the console, an X-station, or a PC running an X emulation package. A newly booted system provides a console prompt.

In a multi-server environment, you should log on at the console of the appropriate server. For example, use the console on the storage library server to monitor storage library activity with SLC. Use the console on the root/index server to run Database Maintenance and set up Image Services security. If the server you want to log on to is not physically near, you can usually use the `rlogin` command to log on to a remote server and run programs from your console or from a window on your PC or X-station terminal. However, not all programs run from a remote server.

After logging on, you can enter operating system commands and read online documentation. You can also start the appropriate system management tool for your operating environment: SMIT (AIX), SAM (HP-UX), Administration Tool (Solaris).

Each Image Services server has a resident operating system and independent file systems. The Image Services root server maintains the network service directory (the network clearinghouse database) and the security database.

Enter your operating system login name. For example, if you enter the login name `fns`, the following prompt displays:

```
fns's Password:
```

Enter your password. If the system accepts your login and password, the appropriate notice displays for your operating environment. Refer to the appropriate description for your operating environment.

AIX

AIX

```
Welcome to AIX Version 3.2!  
Please see the README file  
/usr/lpp/bos for info pertinent to  
this release of the operating system.
```

HP-UX

HPUX

Please wait, checking for disk quotas...

followed by the Hewlett-Packard copyright and other information. You are then prompted to enter the terminal type (or accept the default). When you are successfully logged in, the system prompt displays.

Solaris

SOL

If the system accepts your login and password, the contents of your /etc/motd (message of the day) file displays. After successfully logging on to the operating system, the following prompt may display:

Start Motif?

If you type **y**, Motif starts (see [“Motif Interface \(Solaris\)” on page 35](#)).

Logins

This section describes user accounts (logins). As the system administrator, you can log on to the operating system as any of the following:

- root
- fnsw
- Operating system user account for an Image Services user that you create
- Member of a group such as fnadmin, fnop, or dba

Note Operating system logins are independent of the Image Services logins such as SysAdmin. See the “Security Administration” chapter of the [***System Administrator’s Handbook***](#) for more information on Image Services user logins.

The root Login

The **root** login has permission to perform any operating system task. Do not log on as root unless you must perform tasks, such as creating other operating system logins or running certain Image Services tools, that require root level permission. Because the root login is so powerful, safeguard this login with a secure password and change the password often.

The fnsw Login

The **fnsw** login has access to all Image Services software and acts as the superuser for Image Services software, but does not have operating system root privileges. The fnsw login name acquires privileges through membership in the fnusr and fnadmin groups. You can use the fnsw login to recycle (stop and restart) the Image Services software and to run tools that require Image Services Security.

For tracking purposes (such as accounting), we recommend that you use a login other than fnsw to run Image Services applications. We recommend that you login as a member of the fnadmin group (see below). You should only log on as fnsw to perform tasks that require fnsw privileges. If more than one person uses fnsw (or root), you cannot identify the person performing tasks on the system. Password-protect the fnsw login.

Other User Accounts

Create your own login and add the account to groups such as fnusr, fnop, and fnadmin. Create operating system logins for users who perform certain system tasks, such as backing up the database and running the COLD application. As with the fnsw login, you should carefully password-protect any logins you create. See the appropriate section for your operating environment:

AIX	<u>“Creating an Image Services User Account Using SMIT” on page 40</u>
HP-UX	<u>“Creating a FileNet User Account Using SAM” on page 45</u>
Solaris	<u>“Creating a FileNet User Account Using the Administration Tool” on page 50</u>

Switching Login Names

While you are working at the operating system level, you may need to do some work that requires another login name. Instead of logging out and logging back in with that name, you can temporarily change logins by entering:

su – <login>

If you are logged on as root and changing to another login, you do not have to enter the password for that login. If you are changing to root, you must enter the root password.

To exit the temporary login and return to your original login, refer to the instruction for your operating environment:

Operating System	Action
AIX/6000	Enter Control+d
HP-UX	Enter exit
Solaris	Enter exit

Running Image Services Tools

Certain Image Services tools, such as CSM_tool and PRI_tool, that you run at the command line require an Image Services login name. For more information, see the “Commands” chapter of the [***System Administrator's Handbook***](#). To log on to Image Services Security at the command line, run the **fnlogon** tool. Any tool that requires an Image Services login also accepts root and fns as valid logins.

The fnlogon tool is not necessary if you login using any of the following: root, fns, fnsadmin.

Remote Logins

MultSv

While logged on to one server, you can remotely log on to another server to run applications on the other server. You can start and run, from your own console, applications that reside on a different server on your network.

To log on remotely from an Image Services server, use the **rlogin** command followed by the name of the remote server. For example, if you are at the root/index server console and the storage library server name is lib, you can enter the following to log on to the storage library server:

rlogin lib

To switch to another login name at the same time, use the **-l** option. For example, you are logged on as a member of the fnadmin group. To log on to the remote server as root, enter:

rlogin lib -l root

Respond to the prompt for the root password then proceed as you normally would on that server.

Running an X Windows or a Solaris windows interface enables you to run applications from two different servers in two different windows of the same console. For example, you can run Storage Library Control in one window and Database Maintenance in another window at the same console.

See the manual (man) pages for more information on rlogin.

Logging Out from the Operating System

Log out when you leave the console. If the console is unattended while you are still logged on, anyone can access the system. This poses a security risk when you are logged on as root.

Exiting X Windows

You can exit from X Windows using the following procedure:

- 1 Close all shell windows.

Use the Exit option for any application running in a window. If this does not close the window, then use the Close command.

- 2 Quit the window manager.

- 3 Click the OK button on the popup confirmation dialog.

Note In AIX, you can exit X Windows by holding down the Control and ALT keys and pressing the backspace key simultaneously. All windows close and the command prompt displays.

Exiting Motif

To exit from Motif on the console:

- 1 Close all shell windows.

Use the Exit option for any application running in a window. If this does not close the window, then use the Close command. Point to the upper left corner and drag the mouse pointer to the Close option.

- 2 Exit the window manager.

Press the left or right mouse button while the cursor is in the gray area of the screen. This activates the pop-up dialog from which you select **MWM Quit** to exit.

Logging Out from the Console

To log out from the console:

- 1 Exit from X Windows or Motif as described previously.
- 2 Exit from any shells you started by entering Control+d as many times as necessary until you return to the login shell.
- 3 Enter **logout** or **exit**.

Operating System Interfaces

You can enter commands and run applications using any of the following operating system interfaces:

- X Windows Interface (AIX and HP-UX)
- Motif Interface (Solaris)
- Common Desktop Environment
- ASCII Interface

X Windows Interface (AIX and HP-UX)

You must use an X-station, a PC that supports X Windows, or a PC with an X Windows emulator to use the Image Services graphical user interface (GUI) capabilities to:

- Run Image Services system administration programs, such as the Application Executive, Database Maintenance, and Storage Library Control (SLC).
- Configure the system by running the `fn_edit` tool to access the Configuration Editor.

After successfully logging on to the operating system from an X Windows console, an X Windows prompt displays:

```
Startup Xwindows?
```

Type **y** and press Enter to start X Windows. Three windows open initially. A clock appears in one window, a console window opens to display error messages, and an Image Services user window displays an operating system prompt. Each new window you open contains an

operating system prompt. Starting a program opens a new window as well.

The display of the prompt depends upon your use of the template files we supply for `.login`, `.cshrc`, `.profile`, `.env`, `.xinitrc`, `.xdefaults`, and `.mwmrc` located in the directory `/fnsw/etc/<name>.template` (the `inst_template` program sets up templates).

If you do not start X Windows at login time, you can start it later and open the same windows, including the clock, by entering the **xinit** command.

This command starts the window manager in the background using only one window. You can receive error messages and interact with the operating system in this window. The clock does not start up.

While X Windows is running, you can run ASCII-mode programs in a window instead of having a single application occupy the entire screen. You can use the mouse to switch between windows. For example, since most tools run in ASCII mode, you can run the tools in one window while running Application Executive programs in another window.

You can close any window you are not using by pointing the mouse cursor at the upper left corner of the window, holding down the left mouse button, and dragging down to the Close option. However, rather than closing a window, exit any program running in that window. Most programs have an Exit option on the left-most menu.

Motif Interface (Solaris)

After successfully logging on to the operating system, the following prompt may display:

Start Motif?

This prompt depends upon your use of the template files we supply for .login, .cshrc, .profile, .env, .xinitrc, .xdefaults, and .mwmrc located in /fnsw/etc/<name>.template (the inst_template program sets up templates).

If you type **y**, Motif starts. Two windows open initially—a console window to display error messages and a File Manager window. If you have installed the optional Help Viewer, the Help Viewer window also opens.

To open other windows, click anywhere within the gray area of the screen to activate the pop-up dialog and make your selection from the pull-down menu. Each new window contains an operating system prompt. Starting a program opens a new window as well.

If you type anything but **y**, Solaris starts the ASCII interface (see [“ASCII Interface” on page 37](#)).

If you do not start Motif at login time, you can start it later and open the same windows by typing this command:

xinit

While Motif is running, you can run ASCII-mode programs in a window. Then you can use the mouse to switch between windows. For example, since most tools run in ASCII mode, you can run the tools in one window while running Application Executive programs in another window.

Click in a user window to open the window. You can close any window by pointing the mouse cursor at the upper left corner of the window, holding down the left mouse button, and dragging down to the Close option. First exit (using the Exit option on the File pull-down menu) any program running in a window before closing the window. See the Solaris user manuals for help in using the Motif desktop.

Common Desktop Environment

The Common Desktop Environment (CDE) is a graphical user interface that runs in conjunction with the X Windows System or Motif. Like X Windows or Motif, CDE automatically opens an Error Log window and an Image Services DT term window when you logon.

Note To disable CDE and use X Windows or Motif, refer to your operating environment documentation. To re-enable CDE in the future, you can run the following script as root user: `/fnsf/etc/DTwindows`.

ASCII Interface

If you do not enter **y** at the start X Windows or Motif prompt, the entire display functions as an ASCII terminal with a command prompt (`>`).

System Management Tools

Each operating environment provides a graphical user interface for system administration. Refer to the description for your operating environment:

Operating Environment	System Administration Interface
AIX	<u>“SMIT (AIX)” on page 38</u>
HP-UX	<u>“SAM (HP-UX)” on page 44</u>
Solaris	<u>“Administration Tool (Solaris)” on page 49</u>

SMIT (AIX)

AIX

The System Management Interface Tool (SMIT) is the primary interface to the AIX operating system. You can use SMIT to:

- Add AIX logins
- Create system backups
- Display error and performance information
- Manage software licenses
- Display Image Services processes, datasets, and configuration
- Start up and shut down Image Services software

Many of the items in the FileNet Image Services option have command-line equivalents. Some items require the root login.

CAUTION

Because SMIT updates all appropriate configuration files and keeps a record of your actions, we recommend that you use SMIT to make changes only as directed in this manual. Consult your operating system administrator if you have additional questions on SMIT.

See your AIX documentation for information on SMIT.

Starting SMIT

You can use the System Management Interface Tool (SMIT) to create a new AIX user account (login) for an Image Services user. You can use either of two SMIT versions—windows-based or character-based.

To start the windows-based SMIT, enter **smit** at the command line.

To start the character-based version of smit, enter **smitty** at the command line.

The instructions below assume use of windows-based SMIT.

Creating an Image Services User Account Using SMIT

From the SMIT Main menu and the two succeeding menus, choose:

- Security & Users
- Users
- Add a User

Use the help key for information about any field. For information on security and login recommendations, refer to the AIX documentation.

Any other AIX users you create must have `fnusr` or `fnadmin` or `fnop` group privileges to stop and start the Image Services software. After creating such users, log on as each user and run the `/fnsw/etc/inst_template` program to install the correct user environment for the Application Executive (`.logon`, `.profile`, and other files).

A faster way to the Create User window is to use the fastpath name. The fastpath for creating a new user is:

smit mkuser

When you use a fastpath, canceling that window takes you back to the command line. To perform other functions, such as assigning passwords to the new logins, you can enter SMIT at the beginning instead of using the fastpath. Alternatively, you can use the fastpath for the next task.

The fastpath for entering a password is:

smit passwd

To change attributes of a login (such as which shell to start), use SMIT Change/Show Characteristics of a User. The fastpath to this screen is:

smit chuser

Choose the following options from the menu hierarchy:

Security & Users

Users

Change/Show Characteristics of a User

Assigning and Changing Passwords Using SMIT

To create or change a password for a login, use the **passwd** command while logged on with that login name. You must know the password to change it using the **passwd** command. Here is a sample dialog. Passwords you enter do not appear on the display.

```
% passwd
```

```
Changing password for "root"
```

```
root's Old password:
```

```
root's New password:
```

```
Re-enter root's new password:
```

Use SMIT to assign and change passwords if you don't know the current password.

Checking Security Information Using SMIT

See the online documentation for more information on AIX security.

- 1 Enter **info** at the command line.
- 2 Click the **Topic and Task Index** button.
- 3 Select **Managing**.
- 4 Select **Security**.
- 5 Examine the list of topics and select those of interest.

Checking the AIX Error Log

Use SMIT to check the AIX error log by selecting the following options and referring to the prompts:

- 1 Select **Problem Determination**.
- 2 Select **Error Log**.
- 3 Select **Generate an Error Report**.

Changing the AIX Login Shell

By default, the Korn shell starts when you log in to AIX as one of the following:

- root
- fnsu
- Member of the fndadmin or fnop group

Change the default login shell for a user using SMIT:

- 1 In SMIT, select the following options:

Security & Users

Users

Change/Show Characteristics of a User

- 2 Enter the user name.
- 3 Scroll down to the **Initial PROGRAM** field.
- 4 Change the field value to one of the following:

Shell	Value
Korn	/bin/ksh
C	/bin/csh
Bourne	/bin/bsh

SAM (HP-UX)

HPUX

You run the HP System Administration Manager (SAM) to perform the following system administration tasks:

- Add, modify, and delete HP-UX logins.
- Create system backups.
- Display error and performance information.
- Display Image Services processes, datasets, and configuration.
- Start up and shut down HP-UX software.

The SAM screen hierarchy consists of various menus and dialogs. Menus successively define the task to be performed. Choosing appropriate menu options leads you to a dialog where you enter values for parameters associated with the system management command you are building. When you specify all required values and perform an action, SAM runs the command and displays the results of the command in messages or windows.

SAM records the actions you take during a session in a log. You can use these log files as an audit trail.

CAUTION

Be careful when using SAM to alter the system configuration. Some of these alterations (such as reconfiguring disk volumes and changing security files) can result in a loss of data or undesirable system operation. To use SAM, you must be logged in as root. Do not experiment with options when you are not certain of their functions. Consult your documentation, the SAM help facility, or your operating system administrator if you have questions about the effect of a SAM option or any HP-UX command on your Image Services system.

Accessing SAM

To access SAM, log on to your system as root and enter the following:

sam

Refer to your HP manuals for information about how to use SAM and its options.

Creating a FileNet User Account Using SAM

You use SAM to create a new HP-UX user account (login) for a FileNet user. Use the help key to access information on fields. See the security and login recommendations in the HP-UX documentation prior to creating new login names.

To create a new HP-UX user account (login):

- 1 Choose Users & Groups from the SAM main menu.
- 2 Choose Users from the Users & Groups menu.
- 3 Choose Add from the Actions menu.

Setting Login Attributes Using SAM

HP-UX users that you create must have `fnadmin` group privileges to stop and start the Image Services software. You should log on as that user and run the `/fnsw/etc/inst_template` program to install the correct user environment for Application Executive (`.login`, `.profile`, and other files).

Changing Login Attributes Using SAM

To change attributes of a login, you can use SAM. Choose Users & Groups followed by Users, as described above, but choose Modify from the Actions menu to change the login.

Assigning and Changing Passwords Using SAM

Use **SAM** to create or change an operating system password for a login. Make the following selections from the hierarchy of menus:

- Users & Groups
- Users
- Modify
- Change Password

Then complete the dialog for assigning a new password.

Note SAM does not validate your new password. You can use the `passwd` command to verify whether the new password is at least six characters and contains one non-numeric character.

An alternative to using SAM is to use the **passwd** command to change an operating system password. If you are not the root login, when you use the `passwd` command to change a password, the `passwd` command validates whether the new password is at least six characters and contains one non-numeric character. Type the `passwd` command at the system prompt while logged in with the login name you wish to modify. Then respond to the prompts.

Here is a sample dialog to change the root password (for security reasons, the new password you type does not appear on the display).

passwd

Changing password for root

New password:

Re-enter new password:

Changing the HP-UX Login Shell

Logging on to HP-UX as one of the following starts your default shell:

- root
- fnsu
- Member of the fnadmin or fnop group

Change the default login shell by using SAM to perform the following steps:

- 1 Select the following sequence of menus from the SAM main menu:
Users and Groups
Users
- 2 Select a user ID from the displayed list.
- 3 Select Actions, Modify.
- 4 Edit the [Start-up Program...] field to reflect the new shell.

Administration Tool (Solaris)

SOL

Solaris provides an interface called the **Administration Tool**. The Administration Tool is an OpenWindows tool from which you can access Host Manager, Database Manager, Print Manager, and User Manager applications. From Administration Tool, you can read NIS (SunOS 4.x network information service) and NIS+ (SunOS5.x network information service) maps. To run the Administration Tool, you must be logged on as root and be in a Motif environment. (See [“**Motif Interface \(Solaris\)**” on page 35](#) for Motif start-up information.)

Use the Solaris Administration Tool to perform the following:

- Load databases through the Database Manager.
- Add, modify, and delete printers with the Printer Manager.
- Modify or delete a serial port designation through the Serial Port Manager.
- Add, view, or delete a Host designation through the Host Manager.
- Add, modify, view, copy, or delete a user in the User Account Manager.

For details, refer to your Solaris system administration manuals.

Many of the items in the FileNet Image Services option have command-line equivalents. Some items require the root login.

Administration Tool Help

The Administration Tool provides Solaris online help through the Help button. To access the online help, follow the steps below:

- 1 For an introduction press Help.
- 2 Select a topic of interest from the pop-up menu.

Creating a FileNet User Account Using the Administration Tool

To create a new Solaris user account (login) for a FileNet user, log on as root and perform the following steps.

- 1 Start Motif by typing the following at the command line:

xinit
- 2 Start the Administration Tool in the background by typing the following command:

admintool &

The **&** (ampersand) symbol forces the tool to run in the background.

For details on the use of Administration Tool, refer to your Solaris system administration manuals and the Administration Tool online help.

- 3 From the Administration Tool menu, select User Account Manager.
- 4 From the User Account Manager window, select Edit.
- 5 From the pop-up window, choose Add User.

6 Supply the information for the User Identity window.

Users who start and stop the Image Services software must have `fnusr`, `dba`, and `fnadmin` group privileges. Use the Administration Tool to add these users to the appropriate groups.

7 Run the install template program.

After you create the FileNet user account, log on as the user and run the `/fnsw/etc/inst_template` program. The program installs the correct environment (`.login`, `.profile`, and other files) to allow the user to run Image Services system administration applications through the Application Executive.

8 Log out and log on again.

To effect the install template changes, you must log the new user out and then in again.

Assigning and Changing Passwords Using the Administration Tool

Use the **passwd** command or the Solaris Administration Tool to assign an operating system password for a user login.

If you want to change an operating system password but do not know the current password, use the Solaris Administration Tool to change the password.

If you know the current password, log on as the user and run the **passwd** command to change the password. A sample dialog to change the password of the root login follows. (The password you type does not appear on the display.)

passwd

Changing password for "root"

New password:

Re-enter new password:

Changing the Solaris Login Shell

Logging on to Solaris as one of the following starts the default shell assigned to the user ID upon creation.

- root
- fnsw
- Member of the fnadmin or fnop group

You can change the default shell at any time by selecting a new login shell.

From the **Modify User** function of the Solaris Administration Tool, select the login shell type from the pull-down list:

Korn	For the Korn shell
C	For the C shell
Bourne	For the Bourne shell
Other	For another type of shell

Refer to your Solaris manuals for detailed instructions on how to change your login shell.

Setting Date and Time

Image Services software uses the system date and the system time for scheduling and time stamping events. For example, a deferred print job runs at the scheduled system date and time according to the clock on the server running print services (usually the storage library server). While waiting in the print queue, the job shows the submission time according to the clock on the workstation that submitted the job. If the server and workstation clocks are not synchronized, the print job may print sooner or later than you expect.

As the system administrator, you are responsible for setting all server clocks to the same date and time. The PC coordinator is responsible for setting workstation clocks.

Refer to your operating system manuals for details on how to set the system date and time.

CAUTION

Do not set the date and/or time backwards while the system is running. Set the date and time in single-user mode.

Working at the Console

The following topics describe how to define terminal information files for your terminal type, how to change screen contrast, and how to use the screen saver to prevent screen burn-in. Unless stated otherwise, the descriptions in this chapter assume that you are logged on at the Image Services console.

Terminal Information Files

Setting the terminal type sets the appropriate environment for working at the console. Depending on which terminal type you set, you must select the appropriate terminal information file for that terminal type.

A terminal information file contains keyboard assignments for a particular kind of terminal. Two environment variables—TERMINFO and TERM—define which terminal information file to use for your terminal type. When you log on, these variables are set. However, you can reset the variables at any time. See [“**Changing Your Terminal Type**” on page 59](#) for more information.

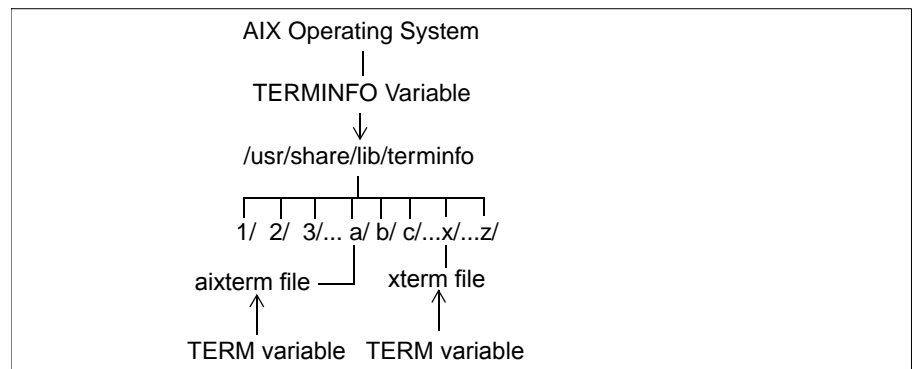
The TERMINFO environment variable specifies the path to the terminal type files supplied with the operating system. When you log on, the TERMINFO variable is set to the default /usr/share/lib/terminfo directory.

The TERM environment variable points to a specific terminal information file. The following table lists the location of the sub

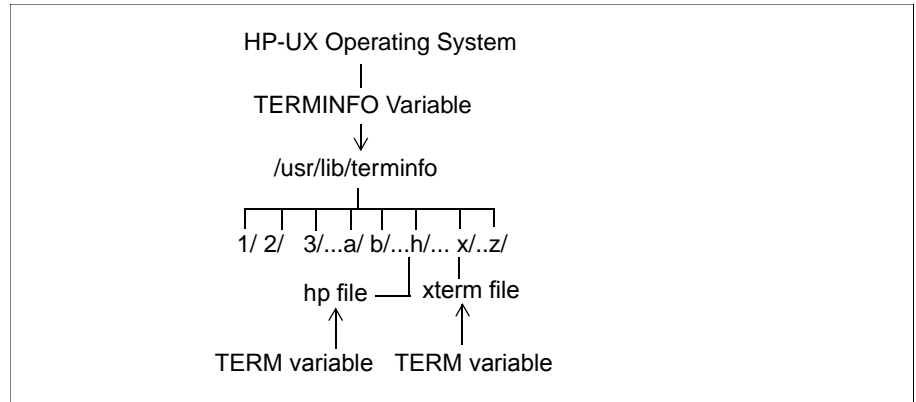
containing the terminal information files for each operating system.

Operating System	Default Directory
AIX	/usr/share/lib/terminfo
HP-UX	/usr/lib/terminfo
Solaris	/usr/share/lib/terminfo

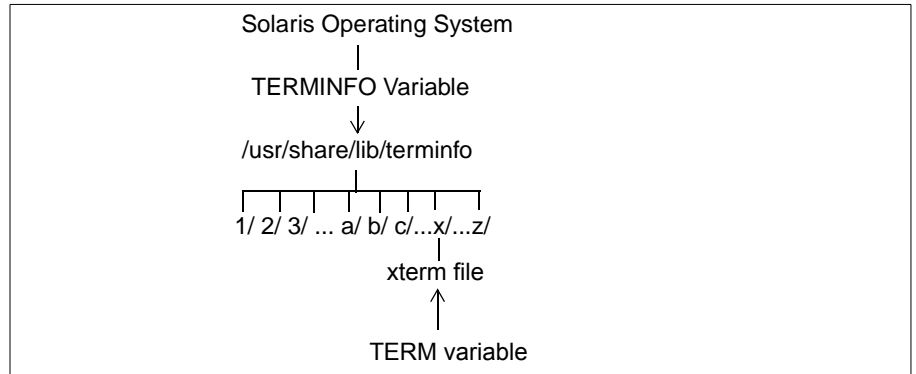
The names of the subdirectories containing the terminal information files consist of a single number, such as /1 or /2, or a single letter, such as /a or /x, representing the first number or letter of the terminal type. Each of these numbered and lettered subdirectories contains terminal information files that provide the capabilities and key mapping assignments for a supported terminal type. Refer to the diagram for your operating environment.



AIX terminal information directory location



HP-UX terminal information directory location



Solaris terminal information directory location

For example, if you set your system console to xterm (a common type), TERM points to the xterm terminal information file located in the `/usr/share/lib/terminfo/x` directory. You direct the operating system to locate the terminal type subdirectory (`/x` in our example) from the first letter of the terminal type you designate in the TERM environment variable. The operating system searches the system default path for the designated terminal information file.

Default Settings for Logins and Groups

The following table lists the TERMINFO defaults and TERM settings when you log on as fnsw or as a member of the fnadmin or fnop group.

Operating System	TERMINFO default	TERM	Description
AIX	/usr/share/lib/terminfo	xterm or	Common setting.
		aixterm	IBM AIX terminal.
HP-UX	/usr/lib/terminfo	hp	Standard environment for HP 700/96 or HP 700/98 terminal.
Solaris	/usr/share/lib/terminfo	xterm	Common setting.

Summary of Terminal Type Assignments

The following table shows examples of settings for commonly used terminal types in an Image Services system.

Operating System	Terminal Type	TERMINFO Path	TERM Setting
AIX	System Console	/usr/share/lib/terminfo	xterm
	X-Station	/usr/share/lib/terminfo	xterm or aixterm
	PC with X emulation	/usr/share/lib/terminfo	xterm or aixterm
HP-UX	System Console	/usr/lib/terminfo	hp
	HP X-Station	/usr/lib/terminfo	hpterm or xterm
	IBM X-Station	/usr/lib/terminfo	xterm
	PC with X emulation	/usr/lib/terminfo	xterm
Solaris	System Console	/usr/share/lib/terminfo	xterm
	X-Station	/usr/share/lib/terminfo	xterm
	PC with X emulation	/usr/share/lib/terminfo	xterm

Changing Your Terminal Type

Logging on to the operating system displays the terminal type setting from the TERM environment variable in the .profile file.

```
TERM=(xterm)
```

Press Return to accept this terminal type. To change the terminal type, enter your terminal type at the prompt. For example, if you are using an X-station, enter:

```
xterm
```

You can change your terminal type at any time by resetting the TERM environment variable. For example, you can set the TERM variable to xterm:

Shell	Commands
C shell	setenv TERM xterm
Korn or Bourne	TERM=xterm export TERM

See your operating system documentation for information on permanently changing a user's terminal type.

Screen Contrast

Use the buttons on the front of your server console to adjust screen contrast so you can easily read the foreground text and the options on the pull-down menus.

Screen Savers

You can change the parameters of the X Windows screen saver using the **xset** command. For information on the **xset** command, search the online documentation for “screen saver.”

The ASCII interface has a different screen saver. When you close X Windows and log out, the console is in the ASCII interface and uses the FileNet screen saver program, **scrsvfnsw**. The screen saver program starts automatically at boot time.

You can modify the text displayed, the time to wait before activating the screen saver, the refresh rate, and the priority with the **scrsvfnsw** command:

```
scrsvfnsw [-t #] [-d <string>] [-r #] [-p]
```

Parameter	Description
-t	Time, in minutes, to wait before starting the screen saver. The default is 15 minutes.
-d	Displayed text. The default is FileNet. This text cannot contain any spaces.
-r	Refresh rate. The default is to change the placement of the display text every second. You can enter a higher number of seconds for the text to remain displayed before changing position.
-p	Run at lower priority.

The following example changes the period of time to wait before starting the screen saver, the displayed text, and the refresh rate:

```
scrsvfnsw -t 10 -d Back_at_10:15 -r 3
```

To redisplay the screen, press any data key, such as the space bar. The key you press only turns off the screen saver. It does not display or have any effect on the system. Keys such as Shift, Control, and Alt do not send data, so they do not turn off the screen saver.

Shells

The login shell is the user interface to the operating system. The operating system provides several shells, including:

- Korn shell
- C shell
- Bourne shell

If you are a new user, we recommend that you learn to use the Korn shell. If you are familiar with the C shell or the Bourne shell, you may be more comfortable working in that shell than in the default Korn shell. Using the Korn shell, you can retrieve and edit a previous command. See your operating system documentation for information on shells.

To change the default login shell, see the appropriate procedure for your operating system:

Operating System	Procedure
AIX	<u>“Changing the AIX Login Shell” on page 43</u>
HP-UX	<u>“Changing the HP-UX Login Shell” on page 48</u>
Solaris	<u>“Changing the Solaris Login Shell” on page 53</u>

Starting a Shell

You can start a new shell at any time by entering the following at the command line of your current login session:

Action	Command
Start a Korn shell.	ksh
Start a C shell.	cs
Start a Bourne shell.	bs (or sh)

When you start a new shell, the previous shell keeps running in the background. If you start several shells, think of them as layered. To return to a previous shell, you must exit from the most current shells.

Exiting a Shell

Enter **Control+d** to exit from a shell.

To log out, you must exit from all shells until you return to the login shell.

Environment Variables

Some of the system administrator's tools require setting environment variables. For example, before you use the `spacerpt` tool, you must set the `F_MAINT_PW` environment variable. The commands to set environment variables depend on the shell you are using, refer to the following table.

Shell	Command	Example
C	<code>setenv <variable name> <value></code>	<code>setenv F_MAINT_PW <i>mypassword</i></code>
Korn	<code>export <variable name>=<value></code>	<code>export F_MAINT_PW=<i>mypassword</i></code>
Bourne	<code><variable name>=<value>; export <variable name></code>	<code>F_MAINT_PW=<i>myfmpswd</i>; export F_MAINT_PW</code>

where *mypassword* is the password you set in the `set_f_maint_pw` script.

Disabling NCH broadcasts

MultSv

The Network Clearinghouse (NCH) shared library on an Image Services server locates distributed resources in the FileNet system for clients (users and application programs). In multiple server configurations, the NCH server software runs on the root server. Non-root Image Services servers access the NCH server to retrieve location and attribute information for other servers. For example, cache services accesses the NCH database for information about the server caches. Non-root Image Services servers locate the NCH server by broadcasting on each network interface or by using the operating system network directory search facility. You can disable NCH server location broadcasts to:

- Reduce broadcast traffic on the network.
- Accommodate a network configuration with routers.
- Specify an IP address configured by the operating system network directory search facility.

You can enable or disable broadcasts any time, without restarting the Image Services software. NCH checks whether broadcasts are enabled on each lookup. If broadcasting is disabled, NCH converts the domain name to an IP host name and attempts to obtain an IP address for the host name using the server name resolution mechanism. For information on the NCH conversion mechanism, see [**“Converting to IP Host Name” on page 65.**](#)

To disable broadcasts on an Image Services server:

- 1 Create the following empty file:

```
/fnsw/local/sd/nch_no_broadcast
```


- 2 Create an alias entry for the NCH domain IP host name using the appropriate server name resolution method, for example:
 - Edit the `/etc/hosts` file on each server.
 - Edit the master `/etc/hosts` file and use the Network Information Service (NIS) to distribute this information to each server.
 - Provide this information through the Domain Name Service (DNS).

Following is a sample entry in the `/etc/hosts` file:

```
135.01.02.0 servername domain-organization-nch-server
```

You can use the `nch_tool`, `findserver`, to locate a server, for example:

```
findserver domain:organization
```

Converting to IP Host Name

NCH converts domain names to IP host names by making the following changes:

- Eliminating all characters except for ASCII alpha-numeric characters and hyphens.
- Converting all characters to lower case.
- Inserting a hyphen between the domain and organization names.
- Appending the string **-nch-server**.

The following are examples of NCH domain to IP host name conversions:

NCH Domain Name	IP Host Name
medea:FileNet	medea-filenet-nch-server
Solar_System:FileNet	solarsystem-filenet-nch-server

3

Directories and Files

This section describes file organization, file naming, and navigation through the file systems.

Root Directory

The root directory encompasses all of the files in the system. A single slash (/) designates the root directory.

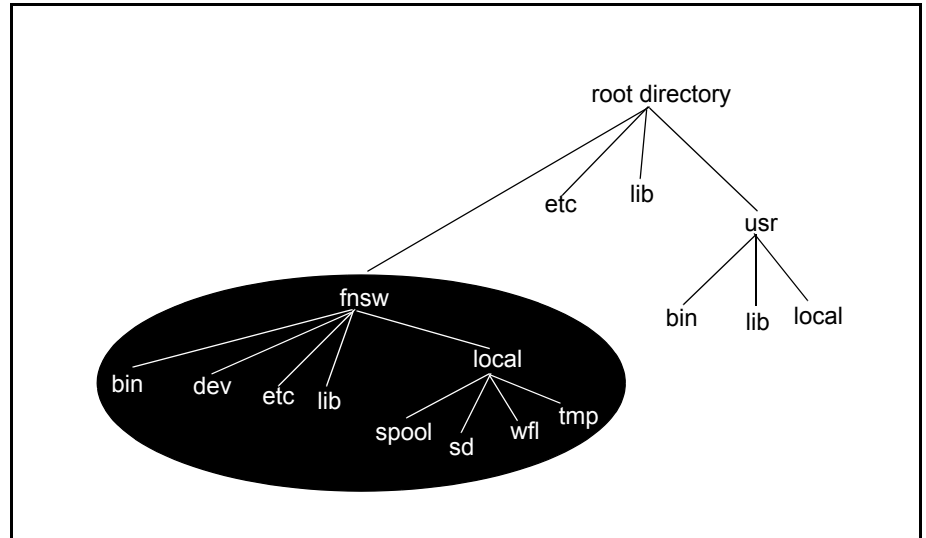
Directories

A directory is a path to a collection of files in a subdivision of your magnetic disk.

To organize files, you use operating system commands to create directories under root and further divide those directories into multiple levels of directories. The file system is a top-down hierarchy that resembles an organizational chart with root as the permanent head.

On an Image Services server, FileNet software resides in a distinct file system, /fns, that uses typical UNIX directory names.

The following diagram shows the subdirectories of /fnsw and the position within the overall file organization.



Abbreviated File System with /fnsw Highlighted

Each server, such as a root/index server or storage library server, contains a separate root directory and directory structure. Each Image Services server has a station dependent subdirectory, sd/1.

File and Directory Names

A file or directory name can have up to 255 characters. We recommend that you observe the usual UNIX limit of 14 characters. For files that may be transferred to PC workstations or DOS-based file servers, use the DOS file-naming conventions and limit file names to eight (8) characters with a three (3) character extension.

You can use letters, numbers, periods, and underscores in file and directory names. The following are valid names:

- sbin
- admin_1.log
- test.script
- lpp_name
- .cshrc

Do not use the following characters, which have special meaning to the operating system:

```
\ / " ' * ; - ? [ ] ( ) ~ ! $ { } < > # @ & |
```

Listing the Contents of a Directory

Use the **ls** command to list the contents of a directory in ASCII order by file name. The **ls** command also lists files that begin with a dot. See your operating system documentation or the online man page for **ls** usage information and options.

Using ls Command Options

The **ls -F** command displays the file name followed by a special character that, by convention in many cases, indicates the file type. For example:

Special Character	Description
.	A file name beginning with a dot (.) contains configuration, resource, or history information. Depending upon the shell, you may need to include an option to see these files in a directory listing.
*	A file name ending with an asterisk is an executable program. For example, <code>history*</code> is an executable program. This convention is set up by a FileNet alias of the ls command.
/	A name that ends with a slash (/) is a directory, not a file. For example, <code>fnsw/</code> is a directory. This convention is set up by a FileNet alias of the ls command.

You can also use the **file** command to determine a file's type. The syntax of the **file** command is:

file <filename>

Using Wildcards

To find a file in a large directory or to operate on many files with similar names without having to type each name, you can use one or more “wildcard characters” in your search criteria. An asterisk (*) or question mark (?) acts as a wildcard character.

The examples below describe the use of wildcard characters.

An asterisk represents any number of characters. The following example lists all names that begin with **do** in the /fnsw/bin directory:

```
> ls do*
docchk*      doccnt*      doccopy*     docimport*
```

The question mark represents a single character. The following example lists all names in the current working directory that consist of a single character followed by an **s**:

```
> ls ?s
es*  gs*  is*  us*  xs*
```

CAUTION

Be very careful when using wildcards in any command that erases or alters a group of files. As a precaution, test wildcards with the **ls** command to make sure you are specifying the correct files. The operating system has no “undo” command.

Working Directory

When you log on at the console, you start at the top of the directory structure, in the / (root) directory. As you work, you can move from one directory to another. If you lose your place, you can find out where you are with the **pwd** (print working directory) command.

The **pwd** command prints the path from the root directory to your current working directory. The path shows the name of the directory at each level with a slash between each level. For example, the **pwd** command might show this:

```
/fnsw/local/dam
```

Moving From One Directory to Another

The **cd** command changes directories. There can be many paths down (away from root), but only one path up (toward root). Because of this, the **cd** command has two handy shortcuts.

```
cd / (cd, space, backslash) takes you to root.
```

```
cd .. (cd, space, period, period) takes you one level closer to root.
```

For example, from the working directory `/fnsw/local/dam`, the **cd ..** command moves you up one level to `/fnsw/local`.

To move to a subdirectory one level lower, specify the subdirectory name as the argument:

```
cd dam
```

Move to any directory by specifying the full path. For example, move from anywhere to `/fnsw/local/dam` with the following command:

```
cd /fnsw/local/dam
```

Making a New Directory

Ask your support representative to designate a location for directories and files that you want to add. We recommend a subdirectory under `/fnsw/local`.

Directory Permissions

When you create a directory under `/fnsw/` the permissions on your files may change. This is because the Image Services `fn_setup` utility uses the `/fnsw/etc/permission_table` to set directory and file permissions for the IS software. There are some directories specified within this `permission_table` that request that `fn_setup` change the permissions of all directories and files below the directory specified (i.e. recursively).

This may cause the permissions of non-IS files and directories stored within the `/fnsw` subtree to be changed. This can result in errors when you try to use or execute those files and can cause many hours of frustration as you attempt to figure out why a certain program that used to run, doesn't run anymore.

The Local Permissions Table

To circumvent this problem, Image Services provides a local permissions table template that you can use to specify permissions for your directories or files. The `fn_setup` program will use both the `permission_table` and the `local_permission_table` files to set directory and file permissions.

CAUTION

DO NOT MODIFY the original `permission_table`. Any changes to the original `permission_table` will be overwritten when the IS software is upgraded.

To Create a local permission table

- 1 Copy `/fnsw/etc/local_permission_table.template` to `/fnsw/etc/local_permission_table`
- 2 Add the directory and file permissions for your files. See the examples below. For information on permissions, see [“Viewing and Changing Permissions” on page 76](#).

The order in which permissions appear is significant and are applied in the order they are specified within the `local_permission_table`. In addition, by default, the permissions assigned to a directory affect the permissions for the files within the directory. If you would like a file to have a different permission than that of the parent directory you must specify the parent directory permission first followed by the permission for each file with that directory.

The `local_permission_table` is an ascii text file in tabular format. Columns can be separated by either tabs or spaces. Any line that begins with either '#' or '/' will be ignored by `fn_setup`.

Field Definitions

Name	Value	Definition
File Type	d,f	directory or file
File Name	<filename>	full path and file name
Dir Owner	<user name>	name of directory owner
Dir Group	<group name>	name of directory group
File Perm	<permission>	Unix chmod permission value, For example, 0770.
File Owner	<user name>	name of file owner
File Group	<group name>	name of file group

Field Definitions, Continued

Name	Value	Definition
Creat-Perm.	<permission> yes, no	create permission Create the file if it doesn't exist?
Recursive able	yes, no	Apply permissions recursively?

Examples:

File Create-type	File Recursive Name	Dir Owner	Dir Group	Dir Perm.	File Owner	File Group	File Perm.	Create-able	Recursive
d	/fnsw	fnsw	fnusr	0770	fnsw	fnusr	0000	no	no
d	/fnsw/bin	fnsw	fnusr	0750	fnsw	fnusr	06750	no	yes

- 3 Save the local permission table.

Note To save your changes, you may have to change the permissions on the file.

- 4 Execute `fn_setup -d <parent directory path>`.

Create the New Directory

To make a new directory in your current working directory, use the **mkdir** command, supplying the name of the new directory as the argument.

For example:

```
mkdir newdir
```

To create a directory in another location, include the path:

```
mkdir /tmp/newdir
```

Removing a Directory

You can only delete a directory which is empty. Use the **rmdir** command to delete an empty directory. For example:

```
rmdir /fnsw/local/newdir
```

Viewing and Changing Permissions

The Image Services system provides security for folders, documents, and other data objects. See the “Security Administration” chapter of the ***System Administrator’s Handbook*** for information on setting up security. This form of security is independent of file and directory security at the operating system level.

The operating system also provides security for files and directories. To display permissions for files and directories, use the **ls -l** (long list) command in any directory. Since these lists are often longer than one screen, you can pipe the output to the **more** command as shown in the following example. The **more** command allows you to page through the display using the space bar.

```
> ls -l | more
total 1104
-rwxrwxr-x  1 root    system    461 Nov 04 12:04 .Xdefaults*
-rwxrwxr-x  1 root    system    682 Nov 04 12:04 .cshrc*
-rwxrwxr-x  1 root    system    455 Nov 04 12:04 .dbxinit*
-rwxrwxr-x  1 root    system    326 Nov 04 12:04 .env*
-rwxrwxr-x  1 root    system     5 Nov 06 13:44 .history*
drwxrwxr-x  8 root    system    512 Aug 12 14:26 export/
drwxrwxr-x 13 fnsw    fnusr    512 Oct 21 15:22 fnsw/
drwxrwxr-x  3 root    system    512 Aug 26 09:14 info/
```

Directory Listing, Long

The following figure shows the information provided for each file and directory, using a sample entry from the `.cshrc` file:

```

- rwx rwx rrx  1  root  system  682  Nov 04  12:04 .cshrc*

```

The diagram illustrates the following fields and their descriptions for the entry `- rwx rwx rrx 1 root system 682 Nov 04 12:04 .cshrc*`:

- `-`: file type
- `rwx` (first): owner permissions
- `rwx` (second): group permissions
- `rrx`: users permissions
- `1`: number of files
- `root`: owner
- `system`: owner's group
- `682`: size
- `Nov 04`: creation date
- `12:04`: creation time
- `.cshrc*`: file description

Refer to the following paragraphs for a description of each field.

File type

Reading from the left, the first character identifies the file type:

file type	Description
-	text or program file
d	directory

file type	Description
c or b	device file (c=character; b=block)
l	link to a file in the same directory or another directory in another file system

Permissions

The permission scheme is in positions two through ten, in three sets of three characters each with the following definitions:

Permission	Description
r	read
w	write
x	execute
–	none

Use the **chmod** command to change permissions. See the `chmod` man page for details.

Owner permissions

The first set (positions two through four) describes the permissions of the owner (root in the example). The `.cshrc` file gives the owner read, write, and execute (rwx) permission.

Group permissions

The second set (positions five through seven) describes the permissions of the group that owns the file (by default, the group to which the owner belongs). The `.cshrc` file gives members of the group read, write, and execute (rwx) permission.

User permissions

The third set (positions eight through ten) describes the permissions for all other users. In the case of `.cshrc`, other users can read and execute the file but cannot write to the file (`r-x`).

Number of files

For a directory, this is the number of files. For a file, this value is always 1. If the file is linked, this is the number of links.

Owner

This is the name of the file or directory owner, that is, the ID of the logged in user that created the file or directory.

Owner's group

This is the group to which the owner belongs.

Size

This is the size of the file or directory in bytes.

Creation date

This is the creation date.

Creation time

This is the creation time.

File name and type designator

The file name and type designator display at the end of each line. An asterisk (*) designates an executable file, a slash (/) is a directory, and the absence of a designator indicates a text or executable file. These conventions are set up by FileNet aliases of the “ls” commands.

Device Files

You access physical devices such as tape drives, disk drives, and printers as files. The interface between devices is transparent to users. The system opens a device, reads or writes information, and finally closes it as if the device were a file. Most device files are stored in a subdirectory of /dev. For instance, /dev/console is the file name for the console.

CAUTION

Do not manually edit files in /dev or /fnsw/dev.

File Systems

The Image Services file system is an integrated set of file systems that appears as one large file system.

The following are examples of file systems:

Image Services File Systems

File System	Directory
AIX/6000	/ (root)
	/usr
	/var
	/tmp

Image Services File Systems, Continued

File System	Directory
HP-UX	/ (root)
	/usr
	/dev
	/tmp
Solaris	/ (root)
	/usr
	/sbin
	/var
	/tmp
	/opt
FileNet	/fnsw
	/fnsw/local

Your system can have additional file systems.

The FileNet software is mounted at /fnsw and subdirectories of /fnsw. A mounted file system is integrated into the operating system by means of a path. For example, the /local file system is mounted at /fnsw/local. A mounted file system is managed by the operating system.

To access data through the operating environment, the data must reside in a mounted file system. The index database, transient database, WorkFlo queues, and cache reside in raw data partitions. No path exists to the files in this area of the disk. FileNet applications make requests of services to access the datasets or partitions containing the databases and caches. Refer to the following paragraphs for a description of the mounted file systems in your operating environment.

AIX Mounted File Systems

The **df** or **df -k** command, for AIX release 3.2.x or AIX release 4.x, respectively, lists the file systems that are mounted:

```
> df
Filesystem      Total KB    free  %used  iused  %iused  Mounted on
/dev/hd4         8192     3940    5%    810   39%    /
/dev/hd2       430080  112716   73%   14411  13%    /usr
/dev/hd9var      4096     1912   53%    117   11%    /var
/dev/hd3         8192     6292   23%     57    2%    /tmp
/dev/lv01      163840   63740   61%    769    1%    /fnsw
/dev/lv02       81920   63212   22%    398    1%    /fnsw/local
/dev/lv00      36864   17360   52%    274    2%    /db2
```

HP-UX Mounted File Systems

The **bdf** command lists the file systems that are mounted:

```
/> bdf
Filesystem          Kbytes   used   avail  %used  Mounted on
/dev/vg00/lvol1     103481   46262   46870   50%    /
/dev/vg00/fnsw      378489  215038  125602   63%    /fnsw
/dev/vg00/local      99385    4035   85411    5%    /fnsw/local
/dev/vg00/lvol5     127241     206  114310    0%    /tmp
/dev/vg00/lvol4     179449     40   71464    0%    /users
/dev/vg00/lvol3     199065   97475   81683   54%    /usr
/dev/vg00/db2       11932   59796   47592   56%    /db2
```

Solaris Mounted File Systems

Solaris manages mounted file systems. On Image Services for Solaris, FileNet requires the use of volume management from VERITAS or Sun. This software creates logical volumes on top of physical disks. It is also used to manage FileNet file systems and datasets and perform disk management tasks. See the VERITAS and Sun documentation for information on how to use these products.

In the following example, the **df -k** command lists the mounted file systems on a VERITAS system:

```
> df -k
Filesystem            kbytes    used    avail  capacity  Mounted on
/dev/vx/dsk/rootvol  336871    33269  269922   11%      /
/dev/vx/dsk/usr      249991    165220  59781   73%      /usr
/proc                 0         0       0       0%      /proc
fd                   0         0       0       0%      /dev/fd
swap                 125324     20    125304   0%      /tmp
/dev/vx/dsk/opt      190407    68340  103027  40%      /opt
/dev/vx/dsk/fnvg/fnsw 335852    96832  205440  32%      /fnsw
/dev/vx/dsk/fnvg/db2 287982    250855  8337   97%      /db2
```

Databases

Image Services uses MKF (Multi-Keyed File) databases and RDBMS (index) databases. You copy these two databases to magnetic tape when you back up the system.

MKF databases

MKF databases include the following:

- Permanent database (Perm_DB)
- Transient database (Trans_DB)
- Security database (Sec_DB)

The permanent database stores storage media addresses for documents and media family information. The transient database contains the cache directory and information about work in progress. The security database contains FileNet security information.

RDBMS (Index) Database

The RDBMS (index) database stores document index values and folder information.

Cache

Cache is a large area that holds data in transit between optical disk and the station that acquired or requested the data. Cache also serves as the permanent location for systems without an optical disk. Cache is divided into different logical areas used for specific purposes. Your FileNet support representative sets a minimum and maximum size for each logical area.

File Operations

This section describes how to create, edit, copy, move, rename, read, combine, and delete files.

Creating and Editing Files

You create and edit text files using one of the following editors:

Editor	Description
ed	line editor
vi	full-screen editor (visual editor)

For information about these editors, see your operating system and user documentation. You can also display a manual (man) page for each editor (for example, `man vi`).

Note AIX also supports INed (full-screen editor) and emacs (full-screen UNIX editor). For information about these editors, see the AIX system documentation. You can also display a man page for each editor.

Copying Files

The **cp** command copies a file using two arguments. The first argument identifies the original file; the second argument identifies the copy.

```
cp /dir1/orig_file /dir2/dup_file
```

If you omit the path from either argument, the operating system assumes that you want to copy to or from your current working directory. You can omit the file name if you copy to another directory and you want to use the same name.

```
cp /dir1/filename /dir2
```

Two files with the same name can reside in different directories, but not in the same directory.

CAUTION

If you copy (or move) a file to a directory that already has a file by that name, the operation overwrites the file in the destination directory. A confirmation prompt does not appear.

Since the operating system has no “undo” command, you should make a copy of the original file if you are uncertain about the results of a command. Then experiment on the copy.

To copy a file to a new name in the same directory, omit the path from both arguments:

```
cp orig_file test_file
```

You can use wildcards to specify a set of files with one command. For example, you could copy all files that end with `.dump` to a `/dumps` sub-directory with the following command:

```
cp *.dump /tmp/dumps
```

Moving and Renaming Files

The **mv** command is similar to the **cp** command described in the previous section, except that **mv** erases the original file or files.

Use the **mv** command to move a file from one directory to another:

```
mv calls_Jan98 /tmp
```

You can also use the **mv** command to rename a file without changing its location. To rename **calls_Jan98** to **Jan_98_PhoneLog** within the same subdirectory, use the following:

```
mv calls_Jan98 Jan_98_PhoneLog
```

You can rename a file and move it to another directory at the same time:

```
mv calls_Jan98 /tmp/Jan_98_PhoneLog
```

Archiving Event Log Files

To copy one or more files to a magnetic tape, use the **tar** (tape archive) command. You can copy your event logs to tape and delete the files from magnetic disk to free significant space on the disk. You can also use **tar** to copy certain site-specific files, in addition to your normal backup, for added security. For example, you can back up your word processing files to tape until the files are committed to optical disk.

For more information on copying RDBMS transaction logs to tape, see the [***Enterprise Backup/Restore User's Guide***](#).

The daily event log files occupy significant magnetic disk space as they accumulate. Periodically copy these files to tape and then delete the files from the disk. Most sites copy the daily event log files on a monthly basis. To copy a month of event log files to tape, enter the following commands:

```
cd /fnsw/local/tmp/logs  
tar cvf /dev/rmt0 */elogYYYYMM*
```

where YYMM equals the year and month to be copied. For example, to copy all of the January 1998 station event logs to tape, enter the following command:

```
tar cvf /dev/rmt0 */elog199801*
```

CAUTION

Use the tar command only if your files can be copied on a single tape. Tar does not issue end of tape warnings.

After you archive the event log files to tape, remove the files for the year and month (YYYYMM) from magnetic disk using the following commands:

```
cd /fnsw/local/tmp/logs/1  
rm elogYYYYMM*
```

CAUTION

Always use care when including wildcard characters in the file name you are deleting.

Displaying Text Files

This section describes commands that display the contents of a text file. For a more complete explanation, display the command's manual page at the console.

cat

The **cat** command displays the contents of the specified file on your screen (for example, the file named **msgs**, as shown below). If the text is longer than one screen, it scrolls to the end of the file, usually too quickly to read.

```
cat msgs
```

more

The **more** command displays files from beginning to end, one screen at a time.

```
more report
```

To scroll down to the next screen, press the spacebar.

If you know the approximate location of the text you want to read, you can use the **+linenumber** option to start reading at a particular line number. For example, to start reading on page 3 of a report that has approximately 60 lines per page, you can skip the first 100 lines.

```
more +100 report
```

You can specify a search string with the **+/pattern** option to start reading two lines before the first occurrence of that string. The following command skips over all of the file until it finds the string **summit**, then it displays the file starting two lines above **summit**.

more +/summit report

less

The **less** command is similar to the more command, but less allows you to scroll up and down in the file at will. While viewing a file, press the following keys on your keyboard to control the display:

less Command Control Keys

Console Key	Action
space bar	scrolls forward (down) one screen
b	scrolls backward (up) one screen
e	scrolls forward one line
y	scrolls backward one line
d	scrolls forward 10 lines
u	scrolls backward 10 lines

The less command is a FileNet command and not part of the UNIX operating system. Refer to the online man pages for more information for this command.

tail

The **tail** command displays the last 10 lines of a file. To view a larger or smaller number of lines, add the **-<lines>** option to your command. The following example displays the last 25 lines of the specified file:

```
tail -25 <filename>
```

Combining Files

The **cat** command concatenates two files and places the result in a third file.

```
cat file 1 file 2 > target
```

If the target file does not exist, the command creates it.

CAUTION

Do not use a file as both the source and the target because **cat** may destroy the source before creating the target file.

Deleting Files

Use the **rm** command to delete a file. Supply the file name as the argument.

```
rm junkmail
```

You can delete a group of files using a wildcard, but be sure you know exactly which files you are deleting. The following command deletes any file in the current working directory that begins with **91**:

```
rm 91*
```

CAUTION

Be careful when using wildcards in any command that erases or alters a group of files. A small error can lead to disaster. For example, if you accidentally type a space between **91** and the asterisk in the command above, you would erase the file named **91** and the files specified by the *****, namely all of the files in your current working directory. Before running the **rm** command, test wildcards with the **ls** command to make sure you are specifying the correct files. The operating system has no “undo” command.

Processes

Processes are local to each server. The system assigns a process ID number (pid) to each process when the process starts running. A process can be started by initialization programs, by another program, or by a user. This section describes how you can manage and monitor processes.

Background Processes

You can start up a program and direct it to run in the background. While the program runs, you can continue to enter commands to the shell.

For example, to compare two text files with the **diff** command. Type a space followed by an ampersand (&) at the end of your command to run it in the background. The system starts the job and shows you the process ID.

```
diff file1 file2 &  
1450
```

The system stops the background process if you log out. To instruct the system to continue the process after you log out, enter **nohup** (no hang up) in front of your command.

```
nohup diff file1 file2 &  
1451
```

Viewing Processes

Use the **ps** command to view operating environment processes. Additional processes display as a result of your commands.

Use the **whatsup** command to view FileNet processes.

Aborting a Process

If your terminal hangs while you are working on a file, you can abort an independent process that you were running.

CAUTION

You can safely abort an independent process you start, such as the vi editor, that is unrelated to FileNet application software. Do not abort any FileNet process unless instructed by your support representative.

For example, assume that the vi editor does not respond to the keyboard.

If you are running vi in the foreground, press Control+c.

If running vi in the background, move to another console or terminal. Use **rlogin** to remotely log on to the server running vi. Then run the **ps** command to find the process ID number (pid) of vi. The **kill** command aborts most processes. Enter the following command, substituting the process ID in place of <pid>:

```
kill -31 <pid>
```

or

```
kill -ABRT <pid>
```

Occasionally the kill command, as shown above, fails. In that case, use the **-9** option to request an unconditional kill. Be careful you have the correct <pid> when using the **-9** option. Enter:

```
kill -9 <pid>
```

Problem Solving

This section discusses the following types of problem solving tools:

- `ps -ef` command
- `fsck` utility
- Operating system dumps
- Reporting a problem to FileNet
- Sending a tape to FileNet

System Profile

Every system develops a pattern of activities and processes, called a system profile. You can sometimes prevent or minimize problems by watching for a deviation from the usual profile.

To identify a normal profile for your system, use the **`ps -ef`** command to list the currently running processes and the system time spent on each one. You can use this command frequently (several times daily) to become familiar with the system workload, average processing times, and so forth. If the system seems slow or other problems occur, you may see something unusual by examining the process listing.

If you notice a change in the typical system workload, such as excessive processing times or mysterious processes, call your support representative.

File System Check Utility (fsck)

When a server is booted up, the file system check utility, **fsck**, runs automatically on each server equipped with a disk. The fsck utility checks all file systems on the server prior to mounting and making the file systems available for use.

Lost and Found Directories

Each file system that fsck checks includes a /lost+found directory. The fsck utility searches for incorrectly allocated or missing data blocks within the file system and places these blocks into new files created under the /lost+found directory. If fsck can determine the name of the file that originally contained these blocks, fsck uses that file name. Otherwise, fsck creates a new generic name, for example, FILE1. You should examine these files to determine whether to save the information or delete the files to recover the space.

Other programs can also put files in the /lost+found directory. If you are unsure about the files in /lost+found, notify your support representative.

Automatic Corrections

The fsck utility with the `-y` option automatically corrects several types of non-critical inconsistencies.

If fsck detects non-critical inconsistencies, fsck prints one or more lines for each corrected inconsistency, identifying the file system corrected and the nature of the correction. After successfully correcting a file system, fsck prints the number of files on that file system and the number of used and free blocks.

If fsck encounters other serious inconsistencies that cannot be automatically corrected, fsck exits with an abnormal return status and an automatic reboot also fails. In this case, fsck displays a message on the server console indicating the errors that were encountered along with a request to run fsck manually.

Operating Environment Problems

Refer to the procedure for your operating environment:

- AIX System Dump
- HP-UX System Core Files

AIX System Dumps

When the AIX operating system detects a fatal error condition, the operating system usually automatically writes a dump to the primary dump device, /dev/hd7, and flashes 888 in the LED.

CAUTION

When a dump occurs, follow the instructions below **instead of** the instructions in the *Problem Solving Guide* to verify the system dump and save it to a tape.

An AIX system dump, if available and usable, can help to determine the cause of a system crash. The dump contains a copy of the system's kernel data at the time of the crash. The following instructions explain how to verify a dump, how to get the information you need to report the problem to FileNet, how to copy a dump to tape, and how to send the tape to FileNet corporate headquarters for analysis if requested.

CAUTION

Do **not** initiate a dump if the LED displays 888! This means the system has automatically dumped. Initiating another dump would overwrite that system dump with one of a running system.

Verifying a Dump (AIX)

When the system dumps automatically, the LED flashes 888.

- 1 Press the Reset button to cycle through a series of three-digit numbers.

The three-digit number appearing just before the 888 reappears indicates whether the dump was successful. The following LED numbers indicate the status of a dump:

0c0	The dump completed successfully.
0c4	The dump device was too small. The dump may still be usable. (In some cases, the dump device may have been large enough, but the system was unable to initiate a dump; zero bytes are written and 0c4 is displayed.)
0c5	The dump device was not accessible and no dump was taken.
0c6	Make the secondary dump device available.
0c8	No dump device is defined.
0c9	The dump is in progress. Wait for completion (you see this if you initiated a dump).

- 2 Write down **all** of the three-digit numbers that follow the flashing 888. Your FileNet Support Representative will request these numbers.

Proceed if the dump status number indicates that you may have a usable dump.

- 3 Reboot the system.
- 4 Log on as **root** user.

- 5 Verify the dump and the dump device with the following command:

sysdumpdev -L

- 6 Use the contents of the devicename field in place of /dev/hd# in the remaining steps. Do not be concerned about the size field as it may be inaccurate.
- 7 Verify the usability of the dump with this command:

crash /dev/hd#

If the dump is usable, the output of the crash command is:

```
Using /unix as the default namelist file.  
Reading in symbols.....  
>
```

If the dump is not usable, the output of the crash command is:

WARNING: dumpfile does not appear to match namelist

Call the FileNet Response Center for assistance if the dump is not usable.

- 8 At the > prompt, enter the following command:

stat

If the time of the crash approximately matches the time the system crashed, then the dump is sufficient for analysis.

Reporting a Dump to FileNet Support (AIX)

After verifying that you have a usable system dump:

- 1 At the crash program's > prompt, enter:

trace

This produces a stack trace of the problem. The following is a sample stack trace:

STACK TRACE:

```
.i_enable ()  
.rdevread ()  
.vno_rw ()  
.rdwr ()  
.kreadv ()
```

- 2 Call the FileNet Response Center.

Your support representative will ask you for stack trace information. If the problem has not occurred at a previous site, your support representative will assign an FTR number and ask you to send a tape copy of the system dump to FileNet. See [“Copying a Dump to Tape \(AIX\)” on page 102.](#)

- 3 At the > prompt, enter **q** to exit the crash program.

Copying a Dump to Tape (AIX)

Assuming that you have a usable dump, copy it to tape as follows:

Note In the following instructions, replace `/dev/rmt#` with the device name of your tape drive, usually `/dev/rmt0`.

- 1 Load a blank tape in the tape drive.
- 2 Copy the appropriate information to the tape with the command:

```
/usr/sbin/snap -gfkD -o /dev/rmt#
```

Note The `snap` command stores information in the temporary directory `/tmp/ibmsupt` before copying the information to tape. The temporary directory needs approximately 35 MB of free space, and the `/tmp/ibmsupt` directory may have insufficient space. If this occurs, use the `-d` option with the `snap` command to specify an alternate directory that has enough space. For example, use this command to use `/fns` as a temporary directory:

```
/usr/sbin/snap -gfkD -o /dev/rmt# -d /fns
```

- 3 Verify the tape with the command:

```
tar -tvf /dev/rmt#
```

HP-UX System Core Files

The following sections describe how to obtain the information necessary to report a system failure to FileNet, how to copy a core file to tape, and how to send the tape to FileNet corporate headquarters for analysis.

If your HP-UX system detects an unrecoverable failure, it attempts to save portions of memory that may be useful in problem solving. These portions of memory are saved in **core** files. An HP-UX core file, if available and usable, can help to determine the cause of the failure. The core file contains a copy of the system's kernel data at the time of the failure. Occasionally, the HP-UX operating system may detect a fatal system error condition called a "panic." When a panic occurs, you should also capture a core file.

CAUTION

If your system panics, follow the instructions below instead of the instructions in your HP problem-solving manual to verify the core file and save it to a tape.

Saving a Core File (HP-UX)

If your system panics, messages display on the console indicating the failure. If the system is able to restart after the panic, the system reboots automatically and, if a /tmp/syscore directory exists, creates a core file in /tmp/syscore. The core file name consists of the word, **core**, a period (.), and six randomly generated characters, for example:

```
core.siWxia
```

An entry is made in the error log file correlating the core file name with the process which aborted. To obtain the name of the aborted process from the core file, type the following command:

```
cstat <corefile>
```

where <corefile> is the name of the file.

If your system is unable to automatically restart after the panic, use the following instructions to capture a core file and reboot your system.

- 1 Press Control+b on the system console.
- 2 At the CM> prompt, enter **TC**.

The TC command saves memory and writes the core file to the /tmp/syscore directory.

- 3 Complete the boot sequence to restart your system.

You can leave the core file in /tmp/syscore directory or copy it to another directory. (A subsequent core file overwrites any previously existing core file.) With the core file residing in a directory, your HP support representative can dial in to your system to examine the file.

Alternatively, you may wish to copy the core file to tape as described in the next topic.

Copying a Core File to Tape (HP-UX)

Assuming that you have a usable dump, copy it to tape as follows:

- 1 Load a blank tape in the tape drive.
- 2 Copy the core file to the tape:

```
tar -cvf /dev/rmt/# /tmp/syscore/HP0.core
```

Replace `/dev/rmt/#` with the device name of your tape drive, usually `/dev/rmt/0m`.

- 3 Verify the tape with the command:

```
tar -tvf /dev/rmt/#
```

Reporting a Problem to the FileNet Response Center

Occasionally, you may have to call FileNet support to report a problem with your system. When you call, your support representative asks you for information. If the problem has not been previously reported, the representative assigns a Field Trouble Report (FTR) number to your problem.

Sending a System Dump Tape to FileNet

You may be asked to send a tape copy of the core file (and possibly other information) to FileNet for analysis.

To ensure that your information is received by the FileNet Response Center, perform the following actions when sending the requested tapes or other documentation.

- 1 Place a label on the tape with the following information:
 - Your company name
 - System name
 - Your name and phone number
 - FTR number
- 2 Send the tape via standard mail or overnight delivery to the following address:
 - FileNet Corporation
 - 3565 Harbor Blvd.
 - Costa Mesa, CA 92626
 - Attention: <insert the name of the support representative>

5

Tape Support

This chapter describes the FileNet-supported tape drives on your server for backup, restore, COLD, and conversion operations for the following operating environments:

- AIX/6000
- HP-UX (HP 9000/800 and HP Integrity)
- Solaris

This section also contains other tape-related information for preparing and using tape media.

See the ***Enterprise Backup/Restore User's Guide*** for additional tape-related issues specific to backup operations, such as labeling new backup tapes and reusing tapes. See your server hardware manuals for more information on data compression and tape capacity.

Tape Media

This section lists tape media specifications for each operating environment. Actual tape capacity depends on tape length, tape density, and compression. Refer to the appropriate section for your operating environment:

AIX/6000 Tape Capacity

AIX

AIX/6000 servers support full-height and half-height tape drives. Full-height 8mm tape drives occupy a slot approximately two inches high in the server. Half-height 8mm drives occupy a slot approximately one inch high. Half-height tape drives have data compression turned on by default. The following table lists tape capacity for full-height and half-height tape drives. The following table lists FileNet-supported tape media for AIX/6000.

AIX/6000 Tape Media

Tape	Application	Length (meters)	Capacity	
			Full-Height	Half-Height
8mm	Backup/Restore	15	600 MB	1.2 GB (approx.)
		54	2.5 GB	5 GB (approx.)
		112	4.5 GB	9 GB (approx.)
			5 GB (uncompressed) 10 GB (compressed)	(Not applicable)
3480/3490	COLD	Cartridge	See the <i>COLD Handbook</i> .	
4mm DAT	Backup/Restore on 43P server, COLD	60	1.2 GB	
		90	2 GB	
1/4-inch cartridge (QIC)	Backup/Restore	(Not applicable)	500 MB	

The values in the above table are for high density tape and uncompressed data (unless otherwise indicated). Cache data is already compressed when written to disk.

For information on setting the TAP_MB variable for your configuration, see [“Setting the TAP_MB Variable” on page 113](#). See the [Enterprise Backup/Restore User’s Guide](#) for information on labeling new tapes and reusing tapes.

HP-UX Tape Capacity

HPUX

The following table lists FileNet-supported tape media for HP 9000/800 and HP Integrity servers. For backup, you specify the tape capacity. The following table lists the average uncompressed and compressed capacity for high density tape media.

HP-UX Tape Media

Tape	Application	Length (meters)	Capacity	
			Uncompressed	Compressed
4mm DAT	Backup/Restore	60	1.2 GB	1.2 to 5.2 GB (approx.)
		90	2 GB (maximum)	2 to 8 GB (approx.)
3480/3490	COLD	Cartridge	See the <i>COLD Handbook</i> .	
8mm DDTs	Export/import documents	112	4.2 GB*	
¼-inch DDTs	Export/import documents	Cartridge (QIC)	525 MB*	
½-inch DDTs	Export/import documents	9-track reels	2400 feet density*	

* See the [System Administrator’s Handbook](#) for more information.

Solaris Tape Capacity

SOL

For backup, you must supply the tape capacity. The following table lists FileNet-supported high density tape media for Solaris.

Solaris Tape Media

Tape	Application	Length	Capacity	
			Uncompressed	Compressed
4mm DAT	Backup/Restore, COLD	60 meters	1.2 GB	1.2 to 5.2 GB (approx.)
		90 meters	2 GB	2 to 8 GB (approx.)
8mm	Backup/Restore	15 meters	600 MB	1.2 GB *
		54 meters	2.5 GB	5 GB *
		112 meters	4.5 GB	9 GB *
8mm DDTS	Document export/import	112 meters	5 GB	
¼-inch cartridge (QIC) DDTS	Document export/import	(Not applicable)	4.2 GB *	
½-inch, 9-track reels DDTS	Document export/import	2400 feet	525 MB *	
			Note: You can only back up a single database per tape.	
			Length multiplied by density. *	

* These values are approximate, based on writing at high density to half-height 8mm tape drives. On half-height tape drives, data compression is on by default. Refer to the [System Administrator's Handbook](#) for more information.

Tape Drives

This section describes the FileNet-supported tape drives for use with FileNet applications. Refer to the appropriate description for your operating environment.

Operating Environment	Tape Drives
AIX/6000	Internal 8mm (standard)
	1/4-inch cartridge (QIC)
	3480/3490
	4mm DAT (43P PCI server)
HP-UX	3480/3490
	4mm DAT
Solaris	Internal 8mm
	4mm DAT*

* On Solaris, the COLD (Computer Output to Laser Disk) application only supports the 4mm DAT tape drive.

See your server hardware manuals for information on your tape drive. For additional information, refer to the following topics/guides:

- [***Enterprise Backup/Restore User's Guide***](#)
- [***“Labeling Tapes” on page 114***](#)

8mm Tape Drive

The internal 8mm tape drive uses an 8mm cartridge which can write from 600 MB to 5 GB of data to a tape.

Data compression is turned on by default for half-height 8mm tape drives. If you have a combination of full-height (older) and half-height (newer) 8mm tape drive models, you can maintain read/write compatibility between the models by turning off data compression on the half-height drives. Then any 8mm tape drive (newer or older) in your configuration can read from and write to any 8mm tape. Contact your FileNet support representative to enable (turn on) or disable (turn off) data compression.

3480/3490 Tape Drive

The COLD application can read data from 3480/3490 tapes. For more information, refer to the *COLD Handbook*.

4mm DAT Tape Drive

The internal Digital Audio Tape (DAT) unit that uses the Digital Data Storage (DDS) format. This tape drive uses a 4mm cartridge and has a data transfer rate of 183K per second. The standard tape drive writes up to 1.3 GB of data to a tape.

Setting the TAP_MB Variable

Depending on the length of tape you are using or the tape drive data compression ratio, you can change the TAP_MB variable. For more information see the [*Enterprise Backup/Restore User's Guide*](#).

Resetting the tape capacity variable only applies when you are writing data to tape. To reset the TAP_MB environment variable, enter the appropriate command for the shell you are using, where `<nnnn>` is the tape capacity in megabytes.

Shell	Command
Korn	<code>export TAP_MB=<nnnn></code>
C	<code>setenv TAP_MB <nnnn></code>
Bourne	<code>TAP_MB=<nnnn></code> <code>export TAP_MB</code>

Tape Quality

Purchase only data-quality tapes. Do not use lower quality tapes intended for video recording.

We strongly recommend that you purchase and regularly use a cleaning cartridge for your tape drives. Check with your tape sales representative for the appropriate type.

Tape-Related Commands

Use the commands in this section to perform system administration tasks related to preparing and using tapes. Detailed information about each command is available in your operating system documentation.

- Labeling Tapes
- Copying Files to Tape

Labeling Tapes

To label new tapes, use the **tapeser** command to assign a serial number to a tape. See the [***Enterprise Backup/Restore User's Guide***](#) for additional information.

Note See the [***Enterprise Backup/Restore User's Guide***](#) for information on labeling tapes for use with Enterprise Backup/Restore.

The following table lists the default tape device name for your operating environment.

Operating Environment	Default Tape Device Name
AIX/6000	/dev/rmt
HP-UX	/dev/rmt/0m
Solaris	/dev/rmt/0mn

You can label a tape with a serial number consisting of six spaces for use during unattended online backups. For more information and examples, see the [***Enterprise Backup/Restore User's Guide***](#).

To assign a label of six spaces to a tape, use the following command, making sure to enclose the six spaces within quote marks as represented below:

Operating Environment	Command
AIX/6000	tapeser -s " " -d /dev/rmt
HP-UX	tapeser -s " " -d /dev/rmt/0m
Solaris	tapeser -s " " -d /dev/rmt/0mn

You can control the use of tapes by assigning a particular character string as the volume label. For example, you can assign a day of the week as the volume label to control which tape can be used on a particular day. To label a tape with the volume label "Monday," use the following command:

Operating Environment	Command
AIX/6000	tapeser -s MONDAY -d /dev/rmt
HP-UX	tapeser -s MONDAY -d /dev/rmt/0m
Solaris	tapeser -s MONDAY -d /dev/rmt/0mn

Copying Files to Tape

You can copy files or logs to tape, for example, to recover space on your disk or to archive log files. This section describes the two most common commands for copying files to tape: **cpio** and **tar**.

The format of the output depends on the command you use. For detailed information on each command, refer to your operating system documentation and the online man pages.

cpio

The **cpio** (copy file archives in and out) command copies one or more files. The **cpio** command reads from standard input, which can be piped from a **find** or **ls** command, and writes to standard output, which is typically a tape device. You use **cpio** to archive your redo logs to tape (see the [***Enterprise Backup/Restore User's Guide***](#)).

Below is a commonly used syntax for copying log files, but this example does not reflect all parameters and options of the `cpio` command:

`cpio -o | -i [options]`

Parameter	Description
<code>-o</code>	Copies the specified files with path name and status information to standard output.
<code>-i</code>	Copies files from the standard input (the output from a previous <code>cpio -o</code> command) to standard output.
<code>[options]</code>	Refer to the man pages for <code>cpio</code> options.

The following example command copies archived redo log files to tape, using piped input from the `ls` command and the verbose (`v`) option to display file names as they are copied. Type the following command on a single line:

Operating Environment	Command
AIX/6000	<code>ls /fnsw/local/archive/logs/arch1_123.dbf cpio -ov > /dev/rmt</code>
HP-UX	<code>ls /fnsw/local/archive/logs/arch1_123.dbf cpio -ov > /dev/rmt/0m</code>
Solaris	<code>ls /fnsw/local/archive/logs/arch1_123.dbf cpio -ov > /dev/rmt/0mn</code>

tar

The **tar** (tape archive) command copies one or more files to a specified tape device. The most common reason for copying a file to tape is to archive your error log files or redo logs. You can copy your error log files to tape and delete the files from magnetic disk to free significant space on the disk.

For added security, you can use tar to back up certain site-specific files to tape. For example, you can back up word processing files until the files migrate to storage media. Using tar to make copies of these files should be in addition to, not a replacement for, your normal backup procedures.

The syntax below reflects a commonly used syntax for copying files, but does not reflect all parameters and options of the tar command:

tar [c | r]vf <devname> <file names>

Parameter	Description
c	Creates a new archive on tape. Writing starts at the beginning of the tape instead of after the last file.
r	Appends a file to the tape. Use this option instead of the c option to begin writing at the end of existing data on tape.
v	Displays each file name as it is copied to tape.
f	Writes to the device or file specified in the next argument encountered (/dev/rmt0 in the examples given below).
<devname>	Specifies the full path name of the destination tape device.
<file names>	Specifies the full path name of the files to be copied to tape.

The following example command copies an archived redo log file to tape:

Operating Environment	Command
AIX/6000	<code>tar cvf /dev/rmt0 /fnsw/local/archive/logs/arch1_123.dbf</code>
HP-UX	<code>tar cvf /dev/rmt/0m /fnsw/local/archive/logs/arch1_123.dbf</code>
Solaris	<code>tar cvf /dev/rmt/0mn /fnsw/local/archive/logs/ARCH1_123.dbf</code>

Cache Import/Export Methods

There may be events which call for the export of cache from one server for subsequent import to another server. This section describes cache objects and programs and utilities that provide time-saving cache transfer alternatives.

Cache Objects

The cache can contain several types of objects. The information below describes these objects and information about the cache's associated transient database. If you have any of these objects in cache, you should back them up:

- Uncommitted batches reside in cache. When a batch is committed, the documents move (logically) from batch cache to page cache. Each document remains locked in page cache until the system writes all copies, both local and remote, to optical storage media.
- The transient database contains information related to outstanding uncommitted batches. If you have outstanding batches, you must back up the transient database at the same time as the batch and page caches.
- Committed documents not yet written to optical storage media remain in cache due to delayed migration or because the system has no optical storage.

- The transient database contains information related to outstanding write requests. If you have outstanding write requests, you must back up the transient database at the same time as the page cache.

Using the Cache Import/Export Program

The Cache Export/Import Program performs an offline backup of selected caches and cache objects. The MKF transient and security databases must be active to perform a cache backup with the Cache Export/Import Program.

You can perform full backups or interval backups with the Cache Export/Import Program. A full cache backup copies all the cache objects to tape or disk. An interval cache backup copies only the cache objects that have been modified since the date you specify in the **Backup Only Objects Newer Than** field of the Select Caches and Objects list box. The specified date is the date the cache object was created or last updated. You must perform one full cache backup before you can perform the first interval cache backup. Interval cache backups should be done cumulatively so that a restore consists of restoring the last full cache backup followed by the most recent interval cache backup. If you have an extremely large cache, you may want to perform daily interval cache backups along with weekly full cache backups.

After you select caches and cache objects to back up, the program locates each cache and the objects within the cache. Cache Export/Import Program creates the following files in the `/fnsw/local/logs/csmei` directory:

- One directory file per backup. A directory file lists all caches and all cache objects contained in the backup. The format of the file name is `CBmmddyyyy_nn.DIR`, where `mmddyyyy` is the date of the

backup and *nn* is the number of times the cache backup has been run in a particular day.

- One data file per backed-up cache. The format of the file name is CBmmddyyyy_*nn*.<cache_id>, where mmddyyyy is the date of the backup, *nn* is the number of times the cache backup has been run in a particular day, and <cache_id> is the cache identifier.
- One log file containing entries for the cache backup activity. The format of the log file name is CBmmddyyyy_*nn*.log, where mmddyyyy is the date of the backup and *nn* is the number of times the cache backup has been attempted in a particular day. The log file is always written to disk.

Backups from the Cache Export/Import Program are compatible with cache backups performed using CSM_exim. See the “Commands” chapter of your [**System Administrator’s Handbook**](#) for instructions on using CSM_exim to back up and restore cache.

Note Cache Backup does not allow you to back up fast batch objects in page_cache. Cache Backup can see fast batch objects, but does not select them for export. If you are scheduling a back up of COLD objects only, the **Objects scheduled so far** value will read 0 because COLD always uses fast batch committal. All other locked objects in the cache are selectable and can be backed up. Cache Backup also exports all items in BES cache and imports them, but it skips all fast batch objects in the page_cache.

Fast batch objects are always seen as objects in page_cache starting with ID number 4160000000. Cache Backup does not select any object with an ID greater than or equal to 4160000000. COLD objects will create temporary objects in page_cache with these numbers, plus any jobs that use the fast batch feature. To get around this issue, enable the **Fast Batch Breakup** feature on the System Application Services tab of fn_edit. After this feature is enabled, all new fast batch objects can be selected by Cache Backup, because Fast Batch Breakup makes these objects appear in the page_cache with the assigned doc_id rather than the temporary fast batch ID.

For more information on the fast batch feature, see Committal in the [*Image Services System Administrator's Handbook*](#).

Select the Cache Objects

Note You must always keep cache and the transient database synchronized (updated to the same point in time). Back up the transient database immediately before or after you perform the cache export/import.

- 1 Log on to your operating system as a member of the fnadmin and dba groups.
- 2 Start the Application Executive as a background job by entering the following at the system command line prompt:

Xapex &

Log in to FileNet software as SysAdmin (or as a user with System Administrator privileges).

- 3 Select Cache Export/Import from the Application Executive Applications menu.
- 4 Select the caches and cache objects to back up from the Select Caches and Objects list box.

The list box displays cache IDs, descriptions, space use information, the number of objects in use, and the number of cache objects in use and locked.

You can select multiple items from the list, as follows:

- To select a range of list items, click and hold the mouse button on the first item in the range and click on the last item in the range.
- To select non-contiguous list items, click on the first item. Then hold down the control key and click another list item.

To remove a selection, select Refresh from the Options pulldown menu.

Use one of the following methods to limit the cache backup:

- Select Backup Locked Objects Only.
- Select Backup Only Objects Newer Than and enter a date.

5 Select the File or Tape button as the backup destination.

If you select File, use the displayed default name or enter a new file name in the File edit box.

If you select Tape, select the tape device from the drop-down list box. Then insert a tape into your tape drive. Make sure the tape is not write-protected.

Note If tape drive problems occur during the backup, Cache Export/Import Program displays a dialog box identifying the problem and requests that you resolve the problem or abort the backup. If the tape format is wrong, Cache Export/Import Program asks you to confirm that you want to reformat and overwrite the tape.

Continue with the next procedure to verify your selections. Otherwise continue with the procedure, **[“Start Cache Export/Import” on page 126](#)**, to start the backup. Select one of the following options:

Verify the Cache Objects

Perform the following steps to verify your selections:

1 Select Show Objects.

The Cache Export/Import Program displays the number of caches and objects to be backed up in the Finding Selected Objects window. To return to the main Cache Export/Import window without reviewing, select Cancel.

- 2 Click OK to access the Selected Objects Report.

Note You can display only one Cache Export/Import - Selected Objects Report window at a time.

- 3 Verify your selections.

For each cache, the Selected Objects Report describes the total sectors used, selected sectors, total objects in the cache, and selected objects. To display objects in a cache, select the cache. The selected cache name appears in the Selected Objects for Cache box, under which displays the system serial number (SSN), document ID, page number, size (in bytes), creation date and time, and locked status of each object in the cache.

- 4 Select Exit from the File pulldown to return to the Selected Objects Report.

To exit Selected Objects Report **without** backing up and return to the main Cache Export/Import window, click the Close button. Otherwise, continue with the next procedure to start the cache backup.

Start Cache Export/Import

- 1 Select the Backup button to start the backup.

Cache Export/Import displays the Finding Selected Objects window, which contains the number of caches and objects to be backed up, and builds temporary catalogs.

Note Large caches require more time to build the catalogs. You can cancel the process at any point and return to the Cache Export/Import screen by clicking Cancel.

- 2 Click OK to access the Backup Status screen and choose one of the following:
 - Click Close to return to the main Cache Export/Import window.
 - Click Begin to start the backup.

To terminate the backup at any time, select **Abort**.

A Completion Statistics window displays the backup progress statistics for each cache and object, as well as elapsed time for the backup.

A Summary window displays time-stamped status messages for the backup. (These messages are also recorded in the Cache Export/Import log file.) If you are using a tape as the backup device, at completion, the last entry of the summary is “Rewinding and ejecting tape....” However, your system may require you to manually eject the tape.

The backup is complete when a message similar to the following appears in the Summary window:

Cache Export/Import successfully completed for <date_time>

The Begin and Abort buttons change to inactive and the Close button changes to active. When you have viewed the completion results, click Close.

A dialog advises you of the location of the log. Record the location then select OK.

- 3 Eject the tape from the drive, if you backed up to tape.
- 4 Exit the Cache Export/Import Program by selecting Exit from the File pulldown list.

Using CSM_exim

The CSM_exim utility backs up (exports) one or more specified logical caches. It includes options to back up only locked objects and to back up only objects with a time stamp later than the date you specify.

CSM_exim does not, however, back up or restore batch information or write request information from the transient database.

If you do not have outstanding batches or write requests, you do not need to back up the transient database in conjunction with a CSM_exim export operation. A CSM_exim import operation updates the transient database.

CAUTION

If there are outstanding batches or outstanding write requests at the time of the CSM_exim export, you must also backup the transient database.

CSM_exim requires 10 bytes of memory for each object to be backed up. If the number of cache objects to be backed up is very large (for example, millions of objects), CSM_exim may fail with an out-of-

memory error during backup attempts. In this case, consider using the Cache Export/Import Program, which does not have this memory constraint.

Refer to the “Commands” chapter in the [**System Administrator's Handbook**](#) for information on using CSM_exim.

Appendix A – FileNet Support Policy

In the past, FileNet provided two methods for backup and restore - the brm_backup utility and the Enterprise Backup/Restore (EBR) program. EBR provides many improved features over brm_backup, including incremental backup, online backup and backup to a file. All new software development will involve EBR only.

NOTE The brm_backup utility is not supported in the current release of Image Services. Customers upgrading to the current Image Services release will need to make sure their archived backups are in EBR format.

If you plan to use a third party backup product, please refer to the Third-Party Backup/Restore Guidelines manual.

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